I. AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions of claims in the application.

1.(Currently Amended)   In an optical network comprising a plurality of sites, a method of carrying out performance equalization of a plurality of channels, wherein each channel travels through the network from one of the sites, called an "add" site for that channel, to another one of the sites, called a "drop" site for that channel, comprising:

a) determining a wavelength-specific figure of merit for each channel-carrying-wavelength at each one of the plurality of sites;

b) for each respective site in the plurality of sites, determining whether the respective site has met an equalization condition on a basis of a certain threshold and the wavelength-specific figure of merit for each channel-containing wavelength at the respective site;

c) when at least one of the sites in the plurality of sites has not met the equalization condition:

determining a channel-specific figure of merit for each channel;

i)   determining a site-specific figure of merit for each site that is a drop site for at least one channel; and

ii)   adjusting a transmit power of each channel in the plurality of channels as a function of the wavelength-specific the channel-specific figure of merit for the wavelength containing that channel at that channel's drop site and as a function of the site-specific figure of merit for that channel's drop site.

2.(original)   A method as claimed in claim 1, wherein each channel from among the set of channels either dropped at or travelling through any one site occupies

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a distinct wavelength of light, wherein determining a site-specific figure of merit for a particular site that is a drop site for at least one channel comprises determining a wavelength-specific figure of merit for each channel dropped at the particular site and evaluating a function of each such wavelength-specific figure of merit.

3.(original)   A method as claimed in claim 2, wherein said function is an averaging function.

4.(original)   A method as claimed in claim 2, wherein said function is the arithmetic mean.

5.(original)   A method as claimed in claim 2, further comprising:

determining, for each site that is a drop site for at least one channel, the maximum and minimum wavelength-specific figures of merit;

wherein determining a site-specific figure of merit for each site that is a drop site for at least one channel is performed only if the difference between the maximum and minimum wavelength-specific figures of merit for at least one site that is a drop site for at least one channel is greater than a threshold.

6.(Currently amended)   A method as claimed in claim 2, wherein adjusting the transmit power of a particular channel comprises:

comparing the ~~channel~~wavelength-specific figure of merit for the particular channel to the site-specific figure of merit for the particular channel's drop site; and

if the ~~channel~~wavelength-specific figure of merit for the particular channel is less than the site-specific figure of merit for the particular channel's drop site, increasing the transmit power of the particular channel;

if the ~~channel~~wavelength-specific figure of merit for the particular channel is greater than the site-specific figure of merit for the particular channel's drop site, decreasing the transmit power of the particular channel.

7.(original) A method as claimed in claim 2, wherein increasing or decreasing the transmit power of a channel is performed at that channel's add site.

8.(Currently amended) A method as claimed in claim 2, wherein at least one of the site-specific figure of merit and the ~~channel~~wavelength-specific figure of merit is the "Q".

9.(Currently amended) A method as claimed in claim 2, wherein at least one of the site-specific figure of merit and the ~~channel~~wavelength-specific figure of merit is the bit error ratio (BER).

10.(original) A method as claimed in claim 1, wherein each channel from among the set of channels either dropped at or travelling through any one site occupies a distinct wavelength of light, wherein determining a site-specific figure of merit for a particular site that is a drop site for at least one channel comprises determining a wavelength-specific figure of merit for each channel dropped at or travelling through the particular site and evaluating a function of each such wavelength-specific figure of merit.

11.(original) A method as claimed in claim 10, wherein said function is an averaging function.

12.(original) A method as claimed in claim 10, wherein said function is the arithmetic mean.

13.(original) A method as claimed in claim 10, further comprising:

determining, for each site that is a drop site for at least one channel, the maximum and minimum wavelength-specific figures of merit;

wherein determining a site-specific figure of merit for each site that is a drop site for at least one channel is performed only if the difference between the maximum and minimum wavelength-specific figures of merit for at least one site that is a drop site for at least one channel is greater than a threshold.

14.(Currently amended)   A method as claimed in claim 10, wherein adjusting the transmit power of a particular channel comprises:

comparing the ~~channel~~wavelength-specific figure of merit for the particular channel to the site-specific figure of merit for the particular channel's drop site; and

if the ~~channel~~wavelength-specific figure of merit for the particular channel is less than the site-specific figure of merit for the particular channel's drop site, increasing the power of the particular channel;

if the ~~channel~~wavelength-specific figure of merit for the particular channel is greater than the site-specific figure of merit for the particular channel's drop site, decreasing the power of the particular channel.

15.(original) A method as claimed in claim 14, wherein increasing or decreasing the transmit power of a channel is performed at that channel's add site.

16.(original) A method as claimed in claim 10, wherein the figure of merit is the optical signal-to-noise ratio.

17.(Currently amended)   A method as claimed in claim 1, wherein each channel from among the set of channels either dropped at or travelling through any one site occupies a distinct wavelength of light, wherein determining a ~~channel~~wavelength-specific figure of merit for a particular channel comprises

determining a figure of merit for the particular channel at the particular channel's drop site.

18.(original) A method as claimed in claim 17, wherein determining a site-specific figure of merit for a particular site that is a drop site for at least one channel comprises determining a wavelength-specific figure of merit for each channel dropped at the particular site and evaluating a function of each such wavelength-specific figure of merit.

19.(original) A method as claimed in claim 18, further comprising:

determining, for each site that is a drop site for at least one channel, the maximum and minimum wavelength-specific figures of merit;

wherein determining a site-specific figure of merit for each site that is a drop site for at least one channel is performed only if the difference between the maximum and minimum wavelength-specific figures of merit for at least one site that is a drop site for at least one channel is greater than a threshold.

20.(Currently amended) A method as claimed in claim 18, wherein adjusting the transmit power of a particular channel comprises:

comparing the ~~channel~~wavelength-specific figure of merit for the particular channel to the site-specific figure of merit for the particular channel's drop site; and

if the ~~channel~~wavelength-specific figure of merit for the particular channel is less than the site-specific figure of merit for the particular channel's drop site, increasing the transmit power of the particular channel;

if the ~~channel~~wavelength-specific figure of merit for the particular channel is greater than the site-specific figure of merit for the particular channel's drop site, decreasing the transmit power of the particular channel.

21.(original) A method as claimed in claim 18, wherein increasing or decreasing the transmit power of a channel is performed at that channel's add site.

22.(original) A method as claimed in claim 17, wherein determining a site-specific figure of merit for a particular site that is a drop site for at least one channel comprises determining a wavelength-specific figure of merit for each channel dropped at or travelling through the particular site and evaluating a function of each such wavelength-specific figure of merit.

23.(original) A method as claimed in claim 22, further comprising:

    determining, for each site that is a drop site for at least one channel, the maximum and minimum wavelength-specific figures of merit;

    wherein determining a site-specific figure of merit for each site that is a drop site for at least one channel is performed only if the difference between the maximum and minimum wavelength-specific figures of merit for at least one site that is a drop site for at least one channel is greater than a threshold.

24.(Currently amended)   A method as claimed in claim 22, wherein adjusting the transmit power of a particular channel comprises:

    comparing the ~~channel~~wavelength-specific figure of merit for the particular channel to the site-specific figure of merit for the particular channel's drop site; and

    if the ~~channel~~wavelength-specific figure of merit for the particular channel is less than the site-specific figure of merit for the particular channel's drop site, increasing the transmit power of the particular channel;

    if the ~~channel~~wavelength-specific figure of merit for the particular channel is greater than the site-specific figure of merit for the particular channel's drop site, decreasing the transmit power of the particular channel.

25.(original) A method as claimed in claim 22, wherein increasing or decreasing the transmit power of a particular channel is performed at the particular channel's add site.

26.(Currently amended)   A method of generating power adjustments used to control the transmit power of a plurality of channels, wherein each channel travels from a corresponding "add" site to a corresponding "drop" site in a WDM optical network comprising a plurality of sites, wherein each channel from among the set of channels either dropped at or travelling through a site occupies a distinct wavelength of light, the method comprising:

 receiving a wavelength-specific figure of merit for each wavelength at each one of the plurality of sitessite;

 determining a channel-specific figure of merit for each channel from the wavelength-specific figures of merit for those wavelength/site combinations corresponding to that channel;

 for each respective site in the plurality of sites, determining whether the respective site has met an equalization condition on a basis of a certain threshold and the channel-specific figure of merit for each channel at the respective site;

 when at least one of the sites in the plurality of sites has not met the equalization condition:

  determining a site-specific figure of merit for each site that is a drop site for at least one channel from the wavelength-specific figures of merit associated with that channel's path; and

  generating the power adjustment for each channel in the plurality of channels as a function of the channel-specific figure of merit for that channel at that channel's drop site and as a function of the site-specific figure of merit for that channel's drop site.

27.(original) A method as claimed in claim 26, wherein determining a channel-specific figure of merit for each channel from the wavelength-specific figures of

merit for those wavelength/site combinations corresponding to that channel comprises selecting the wavelength-specific figure of merit for the one wavelength carrying that channel at that channel's drop site.

28.(original) A method as claimed in claim 26, wherein determining a site-specific figure of merit for a particular site that is a drop site for at least one channel from the wavelength-specific figures of merit associated with that channel's path comprises evaluating a function of the wavelength-specific figures of merit for each channel dropped at the particular site.

29.(original) A method as claimed in claim 26, wherein determining a site-specific figure of merit for a particular site that is a drop site for at least one channel from the wavelength-specific figures of merit associated with that channel's path comprises evaluating a function of the wavelength-specific figures of merit for each channel dropped at or travelling through the particular site.

30.(original) A method as claimed in claim 26, further comprising:

determining, for each site that is a drop site for at least one channel, the maximum and minimum wavelength-specific figures of merit;

wherein determining a site-specific figure of merit for each site that is a drop site for at least one channel is performed only if the difference between the maximum and minimum wavelength-specific figures of merit for at least one site that is a drop site for at least one channel is greater than a threshold.

31.(original) A method as claimed in claim 26, further comprising:

for each channel, supplying that channel's power adjustment to a variable optical intensity controller at that channel's add site.

32.(original) A method as claimed in claim 26, wherein determining the power adjustment for each channel comprises setting the power adjustment for each

channel to the difference between the channel-specific figure of merit for that channel and the site-specific figure of merit for that channel's drop site.

33.(original) A method as claimed in claim 26, wherein determining the power adjustment for each channel comprises setting the power adjustment for each channel to the lesser of a maximum increment and the difference between the channel-specific figure of merit for that channel and the site-specific figure of merit for that channel's drop site.

34.(original) A method as claimed in claim 26, wherein determining the power adjustment for each channel comprises setting the power adjustment for each channel to a quantized approximation to the difference between the channel-specific figure of merit for that channel and the site-specific figure of merit for that channel's drop site.

35.(original) A method as claimed in claim 26, wherein determining the power adjustment for each channel comprises setting the power adjustment for each channel to a fixed increment times the sign of the difference between the channel-specific figure of merit for that channel and the site-specific figure of merit for that channel's drop site.

36.(Currently amended)   An equalizer for generating power adjustments used to control the transmit power of a plurality of channels, wherein each channel travels from a corresponding "add" site to a corresponding "drop" site in a WDM optical network comprising a plurality of sites, wherein each channel from among the set of channels either dropped at or travelling through a site occupies a distinct wavelength of light, comprising:

means for receiving a wavelength-specific figure of merit for each wavelength at each one of the plurality of sitessite;

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means for determining a channel-specific figure of merit for each channel from the wavelength-specific figures of merit for those wavelength/site combinations corresponding to that channel;

means for determining whether each respective site in the plurality of sites has met an equalization condition on a basis of a certain threshold and the channel-specific figure of merit for each channel at the respective site;

upon detection that at least one of the sites in the plurality of sites has not met the equalization condition, said equalizer comprising:

means for determining a site-specific figure of merit for each site that is a drop site for at least one channel from the wavelength-specific figures of merit associated with that channel's path; and

means for generating the power adjustment for each channel in the plurality of channels as a function of the channel-specific figure of merit for that channel at that channel's drop site and as a function of the site-specific figure of merit for that channel's drop site.

37.(Currently amended) Computer-readable media tangibly embodying a program of instructions executable by a computer to perform a method of generating power adjustments used to control the transmit power of a plurality of channels, wherein each channel travels from a corresponding "add" site to a corresponding "drop" site in a WDM optical network comprising a plurality of sites, wherein each channel from among the set of channels either dropped at or travelling through a site occupies a distinct wavelength of light, the method comprising:

receiving a wavelength-specific figure of merit for each wavelength at each one of the plurality of sitessite;

determining a channel-specific figure of merit for each channel from the wavelength-specific figures of merit for those wavelength/site combinations corresponding to that channel;

for each respective site in the plurality of sites, determining whether the respective site has met an equalization condition on a basis of a certain threshold and the channel-specific figure of merit for each channel at the respective site;

when at least one of the sites in the plurality of sites has not met the equalization condition:

determining a site-specific figure of merit for each site that is a drop site for at least one channel from the wavelength-specific figures of merit associated with that channel's path; and

generating the power adjustment for each channel in the plurality of channels as a function of the channel-specific figure of merit for that channel at that channel's drop site and as a function of the site-specific figure of merit for that channel's drop site.

38.(Currently amended)   At least one computer programmed to execute a process for generating power adjustments used to control the transmit power of a plurality of channels, wherein each channel travels from a corresponding "add" site to a corresponding "drop" site in a WDM optical network comprising a plurality of sites, wherein each channel from among the set of channels either dropped at or travelling through a site occupies a distinct wavelength of light, the process comprising:

receiving a wavelength-specific figure of merit for each wavelength at each one of the plurality of sitessite;

determining a channel-specific figure of merit for each channel from the wavelength-specific figures of merit for those wavelength/site combinations corresponding to that channel;

for each respective site in the plurality of sites, determining whether the respective site has met an equalization condition on a basis of a certain threshold and the channel-specific figure of merit for each channel at the respective site;

when at least one of the sites in the plurality of sites has not met the equalization condition:

determining a site-specific figure of merit for each site that is a drop site for at least one channel from the wavelength-specific figures of merit associated with that channel's path; and

generating the power adjustment for each channel <u>in the plurality of channels </u>as a function of the channel-specific figure of merit for that channel <u>at that channel's drop site </u>and as a function of the site-specific figure of merit for that channel's drop site.

39.(Currently amended)   A method of generating power adjustments used to control the transmit power of a plurality of channels, wherein each channel travels from a corresponding "add" site to a corresponding "drop" site in a WDM optical network, wherein each channel from among the set of channels either dropped at or travelling through a site occupies a distinct wavelength of light, the method comprising:

for each site which is a drop site for at least one channel, receiving a ~~channel~~<u>wavelength</u>-specific figure of merit for each <u>channel-carrying-wavelength whose </u>channel <u>is </u>dropped at that drop site;

<u>for each respective drop site, determining whether the respective drop site has met an equalization condition on a basis of a certain threshold and the wavelength-specific figure of merit for each channel-carrying wavelength whose channel is dropped at the respective drop site;</u>

<u>when at least one of the sites that is a drop site has not met the equalization condition:</u>

determining, for each site that is a drop site for at least one channel, a site-specific figure of merit from the ~~channel~~<u>wavelength</u>-specific figures of merit for all <u>channel-carrying-wavelengths whose </u>channels <u>are </u>dropped at that drop site; and

generating each channel's power adjustment as a function of the ~~channel~~<u>wavelength</u>-specific figure of merit for <u>the wavelength containing</u>

that channel <u>at that channel's drop site</u> and as a function of the site-specific figure of merit for that channel's drop site.

40.(Currently amended)   An optical system, comprising:

a main optical path comprising a plurality of sites for carrying a plurality of channels therealong, each channel travelling from a corresponding one of the sites, known as an "add" site for that channel, to a corresponding other one of the sites, known as a "drop" site for that channel, wherein each site which is a drop site for at least one channel has a capability to determine a wavelength-specific figure of merit for each channel<u>-carrying-wavelength whose channel is</u> either dropped at or passing through that site, wherein each site which is an add site for at least one channel has a capability to control the transmit power of each channel for which it is an add site; and

an equalizer connected to each site which is an add site for at least one channel and to each site which is a drop site for at least one channel, said equalizer being adapted to

<u>a)</u> receive a wavelength-specific figure of merit for each wavelength at each <u>one of the plurality of sites</u><s>site</s>;

<u>b)</u> determine a channel-specific figure of merit for each channel from the wavelength-specific figures of merit for those wavelength/site combinations corresponding to that channel;

<u>c)   for each respective site in the plurality of sites, determining whether the respective site has met an equalization condition on a basis of a certain threshold and the channel-specific figure of merit for each channel at the respective site;</u>

<u>d)   when at least one of the sites in the plurality of sites has not met the equalization condition, said equalizer is adapted to:</u>

i)   determine a site-specific figure of merit for each site that is a drop site for at least one channel from the wavelength-specific figures of merit associated with that channel's path; and

ii)   generate the power adjustment for each channel <u>in the plurality of channels</u> as a function of the channel-specific figure of merit for that channel <u>at that channel's drop site</u> and as a function of the site-specific figure of merit for that channel's drop site.